

INVASION OF THE BURMESE PYTHON

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BIGGLESWORTH STUDIOS

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"Now the serpent was more crafty than any other beast of the field that the Lord God had made. He said to the woman, "Did God actually say, 'You shall not eat of any tree in the garden'?" And the woman said to the serpent, "We may eat of the fruit of the trees in the garden, but God said, 'You shall not eat of the fruit of the tree that is in the midst of the garden, neither shall you touch it, lest you die.'" But the serpent said to the woman, "You will not surely die. For God knows that when you eat of it your eyes will be opened, and you will be like God, knowing good and evil..." - Genesis 3:1-24 ESV

"You have once again entered the world of survival horror. Good luck..." - Resident Evil

"It is our failure to become our perceived ideal that ultimately defines us and makes us unique. It's not easy, but if you accept your misfortune and handle it right, your perceived failure can be a catalyst for profound re-invention." - Conan O' Brien

INTRODUCTION

I first had the idea for “Invasion” in the summer of 2012 while I was watching a nature show on Animal Planet. The program described the incredible strength constricting snakes have when crushing their prey. They calculated that the P.S.I. was equivalent to a human body being crushed by the weight of a school bus. I idealized a game that placed the user in control of a snake movements which were manipulated via the touchscreen. This would allow the user to move, sneak, strike, constrict and consume its prey more realistically than any application that has existed. As I gathered knowledge and added gameplay elements, I also become more informed of a real life issue that would work perfect as the scenario for the game.

The Burmese Python is a popular exotic pet that becomes expensive and difficult to manage due to their rapid growth and costly maintenance. Many times these unwanted pets are released into the wild as they are hard to sell once they have exceeded comfortable levels of sustainability. Burmese Pythons released into the Everglades ecosystem have adapted well to their environment. The temperature has an effect on the sex of the hatchlings causing the majority of these snakes to develop female. These females are capable of producing broods of up to 100 eggs at a time. These conditions have worked in favor of Burmese populations, but their collective appetites are causing strain on the native species in the Everglades.

In 1992 Hurricane Andrew was the costliest storm to reach American land. On August 24th of that year an exotic pet store was damaged and the inventory of Burmese Pythons were enabled to escape. Twenty-one years later these snakes have become a serious threat to the natural ecosystem of the Everglades. This mobile app will include the sights, sounds, environments and as many possible details to make the user feel as though they are on an expedition into south Florida’s swamp. I am hoping this project will entertain as much as it will enlighten the user on themes relating to conservation, invasive species and natural ecosystems.

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EXECUTIVE CONCEPT

Sandbox environment to navigate the Burmese Python in a new, yet accommodating environment, Everglades National Park



Genre

Edutainment / Gamification Interactive Documentary

Platform

Apple iOS with eventual ports to Android and Windows Phone

Minimum System Requirements

- Multi-Touchscreen
- Modern smartphone chipsets (quad core?)
- Accelerometer / gyroscope / G.P.S.

Target Audience

- 5th grade to adult
- Adventure / Action / Simulation genre fans
- Nature show enthusiasts

Key Features

- Touch control of the avatar mimics the movements of a snake more realistically than any game to date (the snake responds to swiping gesturing like the app Flight Control)



Flight Control

- Realistic environments, inhabitants and natural sounds recreate the experience of visiting the Everglades National Park (Unity should be able to do the environment and the snake physics)



User Experience

- Player adapts to environment and lives the snakes normal life span of 15 – 25 years (in game time)
- Random artificial intelligence makes each experience unique adding replayability

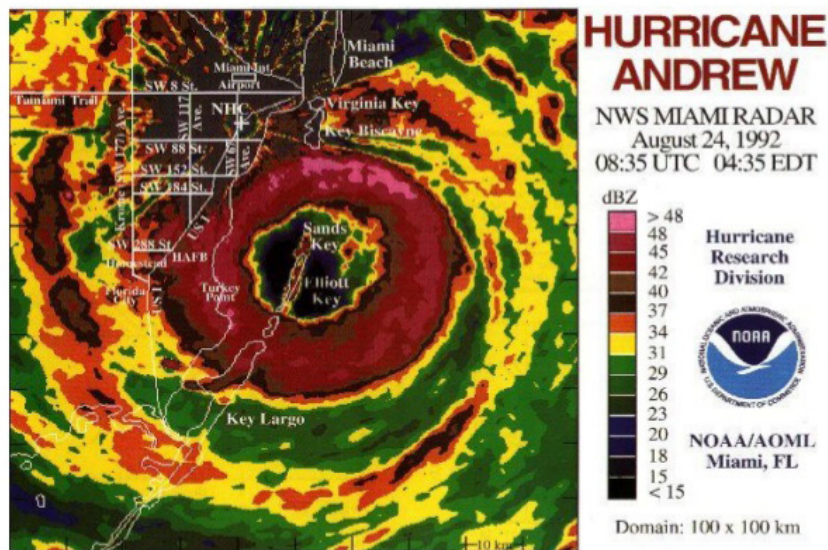
Goal

- Utilize the touchscreen to manipulate proper movement
- Conquer the Everglades National Park

INTERACTIVITY

Game Modes

- After escaping an exotic pet store during Hurricane Andrew on August 24th, 1992 your snake finds its way into the Everglades National Park and must use stealth hunting from tress as a juvenile, water exploration and sneak attack survival living the Burmese Python's life span in **INVASION MODE** (story/campaign)
- Modify settings such as age, date and location and take control of the Burmese Python in its quest for survival and battles for dominance in **SWAMP MODE** (nonlinear/survive as long as possible)



Controls



Tapping will make selections in the menus



Holding

3rd Person camera

Finalized gameplay is not able to be described in detail until an actual prototype is built to test how the control will play best. It seems that a third person view would make the most sense so that the user can view the snake and its surroundings. I want the user to be able to see what is in front of them as the player navigates the three dimensional space. I am also hoping to somehow allow the user to manipulate the camera view to see all around the snake similar to what was is done in modern 3rd person titles like Mario Galaxy, Resident Evil 6 or Halo 4

Camera button

Using a camera button could cycle through the best views. This could cycle trough different present angles. These preset angles could be chosen during development and after playtest to determine which angels work best in which environments and specific situations.

Overhead view (Snake '97)

There should be a way to see the view overhead. This view would seem to be the best for gesturing based gameplay. I am thinking that once the snake has stalked the prey into striking distance, there should be some transitions in views. I am considering this to be the best chosen view to strike the prey and switch to the wrapping constricting gameplay. This has to be the highlight of each battle and if this part of the gameplay fails, the app flops from an experience perspective. The user should feel most like a snake during this moment in the app. Extra attention must be paid to this specific part of the app more than anything. Clips of the snake wrap will be used in trailers and have to look, but most importantly feel cool when being played.

Motion tech

I wonder if the accelerometer could somehow be implemented to maneuver in augmented reality like Face Raiders.

Location

I am also considering the addition of GPS which correlates the user's position to the Everglades as they navigate the environment. For example if the user is facing south, then the snake will be looking south in the map of the Everglades.

Menus

The main menu consist of the two game mode variations **INVASION** and **SWAMP** mode. There is also an "Option" selection where the user can modify the settings.

Game State

The objective of the game is to adapt and live out the lifespan of the Burmese in the Everglades. The player will manipulate the snake via the touchscreen throughout the environment. This large swamp contains different environments

CAMERAS

The game is viewed in the third person perspective with the default setting slightly above and behind the snake. It seems that there should be implementation of a pinch to zoom and spread to pan the camera similar to controls in other three dimensional titles



AxySnake

This view allows the user to see the snake and the environment simultaneously. There are multiple ways to approach the problem of controlling the camera independent of the snake. Since the touch screens primary focus is the movements of the snake, it creates potential worries about controlling the camera with a dual analog stick setup (or something similar). Adding pinch to zoom/pan allows the camera to get close or see more area, but the issue of rotating seems harder to determine without a playable prototype. I am thinking that some form of tilt be used for rotating the camera around the snake to get side angles of perspective

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camera control. Since the snake will be flowing prey from trees, lakes and everywhere in between the swamp, being able to explore will immerse the user within the virtual environment. The goal is to have the user feel as though they have lived life in the Everglades National Park through the eyes of the Burmese Python.

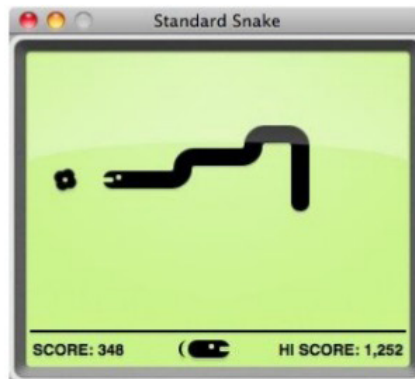
3rd person

This will be used for the exploring and sneaking aspects of gameplay. I am thinking of Metal Gear Solid 3: Snake Eater, but from the perspective of a Burmese Python in the Everglades. The use of an onscreen touch controller should work well for this.



Top (overhead)

This view will make navigating the environment easiest but it also eliminates distance viewing. Recommended once the general layout of the environment is known. This view is useful for wrapping up prey because it is simply more intuitive to gesture swipe from overhead than from a third person perspective. This view also has roots in the classic snake cell phone game.



USER INTERFACE

Demo Mode

The demo mode automatically loads after the production credits and title sequence occur. If the user starts a game this is bypassed. The demo mode loads if the screen stays open without interactivity from the user 15 seconds from the title being displayed. The demo mode shows the Burmese Python in different situations that occur during regular gameplay. The sequences displayed during the demo mode depends on how much of the swamp the user has explored and the lifespan of their snake. These demo sequences uses camera angles found in nature documentaries to provide details of the snake, its environment and other inhabitants. These provide gameplay tips and survival strategies for the user if they view them. There is no tutorial or training mode, although there is a **Practice Mode**. The sequences in Demo Mode are to be narrated by voice actor [REDACTED]

Main Game Menu

The main menu is what connects the different gameplay variants. The user can choose to start a new game, load a game, check records or select augmented reality mode. If the user does nothing the main menu changes into Demo mode until it returns to the main menu by viewing the clip to return to the main menu or this video can be skipped by tapping the screen.

INVASION MODE

This is the main game mode that allows the user to live the “Invasion of the Burmese Python”. You start the game during Hurricane Andrew in 1992 and live the life (in game time and needs to be experimented on) of the snake through maturity. The more areas of the swap that are opened up will give users of **SWAMP** mode more options to choose from before starting their games. The size of the snake determines how the gameplay is focused. The snake will play like it does in life and if young, slither in trees and after building mass, sneaking on the ground.



New Game

Selecting a new game will start the player off as a young female Burmese Python living in an exotic pet warehouse. The date is August 24th, 1992 and Hurricane Andrew is about to release you to the swamp. From this point to user lives out the life span of their snake. As it matures it will go from a tree dwellers to ground based due to its ever increasing size.

Load Game

Due to the harsh realities of survival, it may take some adjusting to the new environment and even luck to make it through the swamp. After the users snake life has expired, they can resume game play from the last save. The load game will return the user to the most recent save spot.

Save Slots

- Slot 1 – 3
- Erase slot

SWAMP MODE

This mode gives the user the choice of setting up the scenario based on how far they have played the **INVASION** mode. The older that the user has gotten the snake in the **INVASION** mode and the areas experienced in the swamp will be added to the **SWAMP** mode once they are accessed in **INVASION** mode. This will create a situation where the user will want to complete the full life span of the **INVASION** mode at least once to be able to recreate any scenario after obtaining them all.

Practice Mode

Practice mode allows you to control an exotic pet Burmese Python with the owner dropping in small feeding prey. The age of the Burm will be around juvenile so users can practice the mechanic of movement, stalking, striking and consuming in a controlled environment.

Options

- Music Volume
- Sound Volume
- Difficulty
- Selected option indicated with an icon next to selections.
- (Options signified with Burmese Python hiss sound effect)
- Credits

SESSION EXPERIENCE

Character Selections

At the beginning of the **INVASION** mode the user can name their snake. The default Burm is a female named “Baby” in reference to a python living at the Serpent Safari Park in Illinois which is 27 feet (8.23 meters) long and holds the record as the world’s heaviest living snake at 403 pounds. Once the sex and name is chosen, the cinema shows the hurricane release the snakes into the freedom of the Everglades.

Pause Menu

- Resume: Returns the user back to the game from the moment it was paused. (I am assuming this will not always work naturally if the game is loading or performing a task where it can’t be

paused. If the user leaves the application, the game should “pause” at the most convenient part for the program)

- Save: Records the snake’s vital statistics including age, sex, length, weight and areas travel in the swamp to on in the three available slots.
- Load: Resumes the selected slot’s character as it was most previously saved. This allows for multiple saves of a single user or up to three separate files. (This save system setup reminds of Nintendo’s Legend of Zelda series so I am also thinking of including a copy option for players wanting to piggyback another user’s gameplay session. I feel that this will allows those who have the app and are close to friends who do not, they will share the experience due to the nature of the save setup)
- Options: Takes the user to the options screen which is also available from the main menu
- Quit: Exits the user’s current game. There is a warning noticed displayed informing and confirming this choice prior to leaving as the game resumes at the last saved game

Display

The visual goal of the game is to takes the user on an expedition of the Everglades Natural Park. The continuous labeling of an overlaying heads up display is not recommended. I feel like other visual and gameplay cues are added to compensate for displaying motives and other statistical information. Loss of energy will cause your snake to move slower meaning he is past feeding time. When the game is paused there should be information made available to the user such as time, date, weather, location and health. There are no items to use and this information is only available to the user when the game is paused. Also by placing this data in the pause screen allows for full screen use during gameplay

PLAY CONTROL

All of the snake’s movements are controlled via the touchscreen by placing a finger on his head and leading him around the environment. Climbing and swimming will be performed in context when available. Sneaking will be instrumental to setting up strike opportunities so the user must move slowly and sometime stop during these moments. I want a heartbeat sound of the targeted prey to occur when the snake is closing in on it. The striking system is a rapid sliding stroke across the touchscreen aimed at the intended target. Timing is important to successfully latch on and begin the constriction process. Missed strikes will most likely cause the prey to flee resulting in a missed opportunity. On the snake has latched on to its prey, the user will make a circular motion (depending on the size of the prey, the constriction may need to be adjusted) For example if you are taking down an opossum as an adult, small circling works best to wrap the prey immediately. They bigger the prey the larger the circling swipes must be. I also want these battles to be a fight for survival. The smart device should vibrate signaling the struggle of the prey and gradually decrease in intensity as the animal succumbs to suffocation.

Snake Movement

The touch screen controls the snake. The use of an on screen controller allows the user to decide which of the screens area the will sacrifice to move. Removing the touch control and replacing it elsewhere will resume the snake’s movement. This allows the user to focus on the direction of their choosing.

Sneaking

When the user gestures the direction of the snake's movements, the length of the swipe is considered. A long/fast swipe causes the snake to move at its top speed, while brief/short swipes allow the snake to slither silent. This is how you sneak up to prey unnoticed. Using the environment helps as well to get within optimal range. The closer you get to your targeted prey, an audible heartbeat will signify the proximity. The tempo increases the closer the gap between the snake and prey.

Striking

This gesture works only when prey is within striking distance. The snake should have some slight animation signifying this. The user will swipe in the direction to the prey swiftly. Factors are determined within the program as to whether this strike is successful. Once connected, the user must wrap the prey up by swiping the touchscreen in circles to constrict. The device should vibrate as much as possible during the connected strikes.

Swallowing

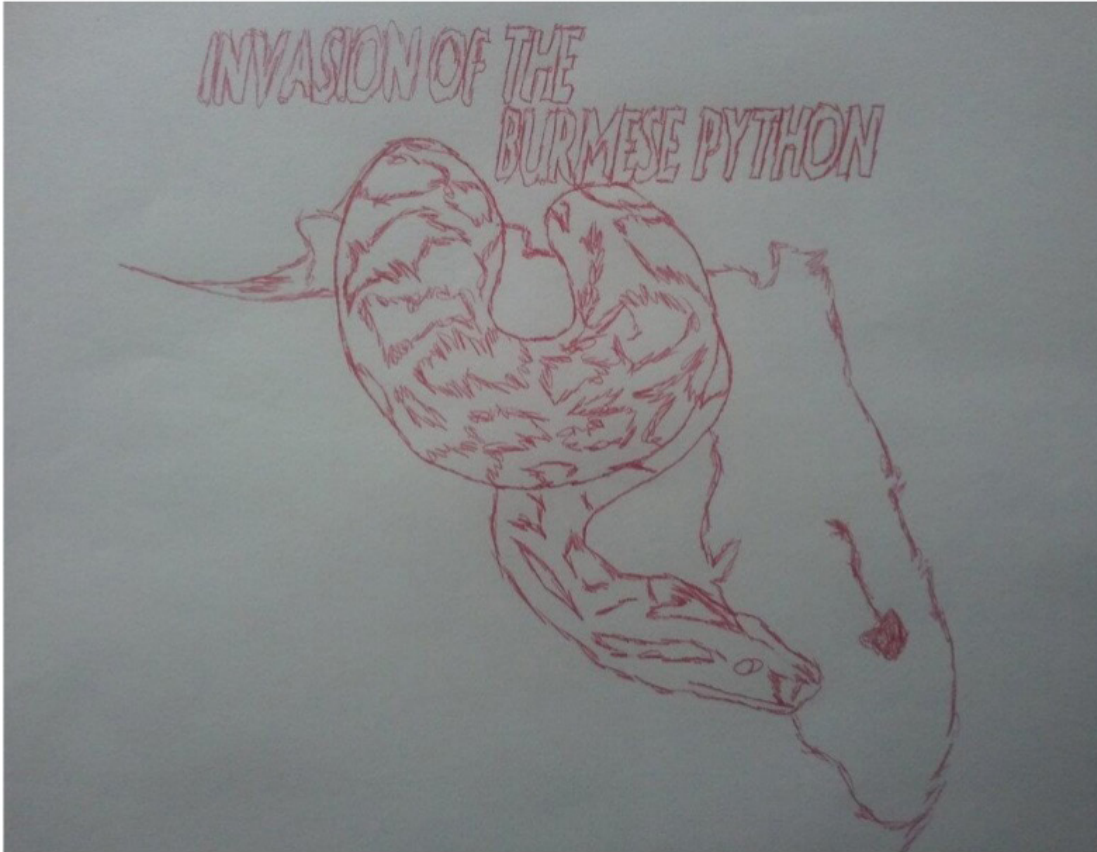
After the prey's last breath, you will be able to feed. This process occurs in rapid fashion but not an immediate gulp. I think this animation should include the additional length added to your snake. The cycle of growth is based on consumption. The bigger the kill, the bigger the growth benefit and the more equipped your snake becomes for even bigger prey. Feeding is essentially leveling up as increases the user's statistic and satisfies its sustenance requirement.

Surviving

The swamp is filled with predators so surviving will take patience and skill. The hunters can easily become the hunted in nature. The app should represent this quest for dominance realistically and the advice of experts must be implemented to ensure that genuine knowledge is gained by the users.

CONCEPT ART AND PRODUCTION DESIGN

For this application to faithfully represent the Everglades National Park, some elements need additional research with the experts in the field. Audio may need to be recorded and added photos/video may need to be taken as well. For this experience to fully immerse the user all realism must be represented as they are in reality. Creative liberties are assessed on a case by case basis when dealing with inconsistencies with actuality and gameplay.



Visual Style

The app is to appear as though it is a documentary show similar to an episode of Animal Planet. Unity should be able to work for the environments and possibly physics. UDK is another potential option for licensed engines and Havoc for physics. I want the animals represented to move realistically from all perspectives and during all actions. Textures should be from assets of the actual inhabitants and ecosystem of the Everglades National Park. I consider this application to be a modern work of art, but the elements are true and thus classified as non-fiction. If it looks real it will be taken more seriously, but if it is too real that may turn off or alienate users. This is another area that may need to be tweaked during production.



I am also thinking of perhaps a cel-shaded look like the images of these markings to make the game stay real without being completely graphic. I believe this graphical tricks are actual beneficial to rendering environments and animations in real time. This could increase marketability, broaden appeal and spread awareness.

Audio Environment

I am not so sure I even want any music in this app. What I do want is as many possible sound effects and noises that you would hear out in the middle of the Everglades National Park. The natural orchestra of random bugs, slithering tongue and water splashing from a swamp. If this audio can somehow be developed for head phone users, it would add a level of immersion through using stereo/surround sound audio cues. When the snake has targeted prey and moves in for the kill, the sound of the intended prey heartbeat that vibrates the phone. This would lead into the battle

Music

I might create different themes for areas and parts of game play. For example, I may want to score the game so it is not completely void of audio sound except for recorded noises. The music would not have recorded vocals and must match the mood with the theme of survival. The opening cinema where hurricane Andrew will most likely benefit from some suspenseful music similar to what was used in the trailer.

Cast

The criteria for me choosing which animals or plants appear in the game are based on factors of reality and notability. Any living thing appearing in the app must be known to exist in The Everglades National Park. Also there are endangered species struggling for survival and their inclusion in the app is to show them in their natural environment. The likeness of seeing these during an expedition to the Everglades may not be as common as in the app. This decision is made to draw attention to issues beyond the Burmese invasion. Not all of these will appear or will be added in updates periodically. Some may also not be included for the sake of gameplay intuitiveness. It is important that signature icons of Florida such as gators, panther and manatees receive priority. These creatures are pieces of a unique environment and I want this app to have a distinctive Floridian feel to it. The understanding here is the experience transports the user to another world that has characteristics sights and sounds.

ALIEN INVASIVE SPECIES

☆Burmese Python (*Python molurus bivittatus*)

Burmese pythons, with their beautifully patterned skin, rapid growth rate, and generally docile disposition, may be best known as the large snake of choice among reptile owners. Unfortunately these potentially huge constrictors are often poorly cared for and are frequently released into the wild. Attacks on handlers, sometimes deadly, are not uncommon.

Native to the jungles and grassy marshes of Southeast Asia, Burmese pythons are among the largest snakes on Earth. They are capable of reaching 23 feet (7 meters) or more in length and weighing up to 200 pounds (90 kilograms) with a girth as big as a telephone pole. When young, they will spend much of their time in the trees. However, as they mature and their size and weight make tree climbing unwieldy, they transition to mainly ground-dwelling. They are also excellent swimmers, and can stay submerged for up to 30 minutes before surfacing for air.

Burmese pythons are carnivores, surviving primarily on small mammals and birds. They have poor eyesight, and stalk prey using chemical receptors in their tongues and heat-sensors along the jaws. They kill by constriction, grasping a victim with their sharp teeth, coiling their bodies around the animal, and squeezing until it suffocates. They have stretchy ligaments in their jaws that allow them to swallow all their food whole.

Habitat depletion, continued demand for Burmese pythons in the pet trade, and hunting for their skins and flesh have landed these graceful giants on the threatened species list. About three months after mating, a Burmese Python is ready to lay its eggs. It can lay up to 100 eggs at a time, and once it does this, it pushes them all together and coils around them. For the entire time the babies are in the eggs, the mother stays coiled around them. She does not leave to do anything - not even to eat. She keeps them warm by vibrating her muscles and protects them from predators. The mother stays with them for about six to eight weeks, and at that time, the eggs are ready to hatch. The baby pythons hatch to be about 20 inches long and can weigh up to 5 ounces. After they have hatched, the mother leaves them on their own. They must fend for themselves and find their own food to survive. The snakes then grow up to between 15 to 25 years of age. Once they reach adulthood, the females and males mate, and the life cycle begins at the beginning again.



ENDANGERED SPECIES

☆American alligator (*Alligator mississippiensis*)

The American alligator is a large, semi-aquatic, armored reptile that is related to crocodiles. Their body alone ranges from 6 - 14 feet long. Almost black in color, it has prominent eyes and nostrils with coarse scales over the entire body. It has a large, long head with visible upper teeth along the edge of the jaws. Its front feet have 5 toes, while rear feet have 4 toes that are webbed.



Arctic Peregrine Falcon (*Falco peregrinus tundrius*)

Falco, the genus, from the Latin falx, means sickle-shaped. This may refer to the shape of the wings in flight or to the talons or even to the beak shape. Peregrinus, the species, comes from the Latin for traveling or wandering, a reference to the migrations of the birds.



Atlantic Ridley Turtle (*Lepidochelys kempi*)

The smallest member of the sea turtle family, this reptile is also considered the most endangered. Adults grow to a length of 20-28 inches (51-71 cm) and weigh 80-110 pounds (36-50 kg). Atlantic ridley sea turtles have a distinctive round to heart-shaped shell that ranges in color from gray-brown to olive to black. The underside is yellowish on adults and white on juveniles. Prey items include crabs, fish, jellyfish, squid, snails, clams, starfish and some marine vegetation.



Cape Sable Seaside Sparrow (*Ammodramus/Ammospiza maritimus mirabilis*)

Cape Sable seaside sparrows are small birds about 13 centimeters or 5 inches long. Dorsally, they are dark olive-gray with olive-brown on the tail and wings. The greenish cast on the nape is generally difficult to detect. Ventrally, adults are light gray to almost white with dark olive-gray streaks on the breast and sides. Occasionally, the breast streaks converge forming a diffuse central spot. There is a dark whisker on either side of the white throat. These sparrows have yellow lores, brown eyes, and a gray ear patch behind the eye which is fringed by a dark line. There is a small patch of yellow on the edge of the wing. No sexual differences in the plumages are obvious.



Crenulate lead-plant (*Amorpha crenulata*)

Amorpha herbacea var. *crenulata*, a semi-deciduous shrub, has several flower spikes that range in color from white and orange to blue and purple. The small, dark green leaflets are numerous (25-35) on a reddish branch. *Amorpha herbacea* var. *crenulata* is known from the Miami Rock Ridge Pinelands, an extremely rare and threatened ecosystem which contains over 40 endemic species



☆Eastern Indigo Snake (*Drymarchon corias couperi*)

Average adult size is 60-74 inches (152-188 cm), record is 103.5 inches (262.8 cm). Adults are large and thick bodied. The body is glossy black and in sunlight has iridescent blue highlights. The chin and throat is reddish or white, and the color may extend down the body. The belly is cloudy orange and blue-gray. The scales on its back are smooth, but some individuals may possess some scales that are partially keeled. There are 17 dorsal scale rows at midbody. The pupil is round. Juveniles are black-bodied with narrow whitish blue bands.



☆Florida Panther (*Puma concolor coryi*)

The Florida panther is a large, long-tailed cat with a great deal of color variation: pale brown or rusty upper parts, dull white or buffy under parts; tail tip, back of ears, and sides of nose are dark brown or blackish. Mature male panthers examined in the wild in Florida since 1978 have weighed from 102 to 154 pounds and measured nearly 7 feet from nose to tip of tail. Females were considerably smaller, with a weight range of 50 to 108 pounds and measuring about 6 feet



Garber's Spurge (*Euphorbia garberi*)

A rare species of flowering plant in the euphorb family and is endemic to Florida, where there are 17 known occurrences, fourteen of which are located on fourteen separate islands of the Florida Keys. The populations vary in size, with four containing fewer than 20 plants each and one containing over one million. The plant has been reduced to a small portion of its former distribution and remaining populations are threatened by a number of processes. This is a federally listed threatened species of the United States.



Green Turtle (*Chelonia mydas*)

Green sea turtles are Chelonians — which means they have four legs and a tough shell made of two parts which join at the sides. Chelonians also have strong horny mouths or beaks with no teeth. There are three types of Chelonians - tortoises that live on land, terrapins that live in fresh water, and marine turtles that live in the sea. They are all members of the Class of Reptiles (Reptilia). The green sea turtle's legs are shaped like flippers. Their heads are lizard-like, with a hooked beak and toothless jaw. Adult green sea turtles may grow up to 99 external cm long and weigh 180 external kg.



Hawksbill Turtle (*Eretmochelys imbricata*)

The hawksbill's appearance is similar to that of other marine turtles. It has a generally flattened body shape, a protective carapace, and flipper-like arms, adapted for swimming in the open ocean. *E. imbricata* is easily distinguished from other sea turtles by its sharp, curving beak with prominent tomium, and the saw-like appearance of its shell margins. Hawksbill shells slightly change colors, depending on water temperature. While this turtle lives part of its life in the open ocean, it spends more time in shallow lagoons and coral reefs.



☆Key Largo Cotton Mouse (*Peromyscus gossypinus allapaticola*)

This mouse only seems to thrive in the Hardwood Hammock Forests of Key Largo, Monroe County, Florida. It is yet another case of a species becoming extinct because of the human need to urbanize and its unintended effects. Although I personally feel it is obvious that all urban development takes planning, this species cannot compete with rats and domestic cats that might prey on them.



☆Key Largo Woodrat (*Neotoma floridana smaili*)

The Key Largo woodrat is a medium-sized (200-260 gram) rat with a gray-brown back and head. Its belly, chest, and throat are white, and the tail is hairy. This species is a nocturnal herbivore, feeding on the buds, leaves, and fruit of many plant species. Food may be stored in the stick nests built by this species.



Piping Plover (*Charadrius melodus*)

The Piping Plover is a small sand-colored, sparrow-sized shorebird that nests and feeds along coastal sand and gravel beaches in North America. The adult has yellow-orange legs, a black band across the forehead from eye to eye, and a black ring around the neck. This chest band is usually thicker in males during the breeding season, and it's the only reliable way to tell the sexes apart. It is difficult to see when standing still as it blends well with open, sandy beach habitats. It typically runs in short and stops.



Red-Cockaded Woodpecker (*Picoides borealis*)

22 cm. small black-and-white woodpecker with longish bill. Above black barred white. Below white with black spots on flanks. Black crown, nape and moustachial stripe border white cheeks and side of neck. Male has small red mark on the side of nape. Juvenile browner with variable extent of red on crown.



Schaus Swallowtail Butterfly (*Papilio aristodemus ponceanus*)

Dorsal sides of forewing are dark brown with a central yellow or white band. Tails have yellow margins and a row of yellow or white crescents. Wingspan is 9.2–11.8 cm (3.6–4.6 in).



☆West Indian Manatee (*Trichechus manatus*)

Manatees are marine mammals found in marine, estuarine, and freshwater environments. The West Indian manatee, *Trichechus manatus*, includes two distinct subspecies, the Florida manatee (*Trichechus manatus latirostris*) and the Antillean manatee (*Trichechus manatus manatus*). While morphologically distinctive, both subspecies have many common features. Manatees have large, seal-shaped bodies with paired flippers and a round, paddle-shaped tail. They are typically grey in color (color can range from black to light brown) and occasionally spotted with barnacles or colored by patches of green or red algae. The muzzle is heavily whiskered and coarse, single hairs are sparsely distributed throughout the body. Adult manatees, on average, are about nine feet long (3 meters) and

INVASION OF THE BURMESE PYTHON

weigh about 1,000 pounds (200 kilograms). At birth, calves are between three and four feet long (1 meter) and weigh between 40 and 60 pounds (30 kilograms).



INDIGENOUS SPECIES

Mammals

- ☆ Florida black bear
- Everglades mink
- ☆ Key deer
- ☆ Lower Keys marsh rabbit
- ☆ Sanibel Island rice rat
- ☆ Silver rice rat

Reptiles

- ☆ American crocodile
- Atlantic salt marsh water snake
- Blue tail mole skink
- Sand skink
- Loggerhead sea turtle
- Leatherback sea turtle

Amphibians

- Flatwoods salamander
- Georgia blind salamander
- Pine Barrens tree frog
- Florida bog frog
- Gopher frog

Birds

Everglade snail kite
 Brown pelican
 Roseate tern
 Snowy egret
 Little blue heron
 Tricolor heron
 White ibis
 Wood stork
 Roseate spoonbill
 Burrowing owl
 Crested caracara
 ☆ Bald eagle
 Osprey
 Snail kite
 Florida scrub jay
 Florida grasshopper sparrow
 Kirtland's warbler
 Bachman's warbler

Invertebrates

Stock Island tree snail

Fish

Atlantic sturgeon
 Short nose sturgeon
 Shoal bass
 Suwannee bass
 Rivulets
 Lake Eustis pupfish
 Black mouth shiner
 Bluenose shiner
 Salt marsh topminnow
 Key silverside
 Crystal darter
 Harlequin darter
 Southern tessellated darter
 Key blenny

Plants

Four-petal pawpaw	Scrub plum	Small's milkpea	Scrub mint
Florida bonamia	Wide-leaf warea	Highlands scrub hypericum	Lakela's mint
Fragrant prickly-apple	Carter's mustard	Beach jacquemontia	Scrub buckwheat
Deltoid spurge	Florida ziziphus	Scrub blazing star	Snakeroot
Pygmy fringe-tree	Saw grass	Scrub lupine	Strangler fig
Florida golden aster	Swamp lily	Britton's beargrass	Strap fern
Florida perforate cladonia	Perphyton	Papery whitlow-wort	Turtle grass

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Pigeon wings	Pinnacle rock	Prop root	Red mangrove
Short-leaved rosemary	Air plant	Sandlace	
Avon Park harebells	Gumbo limbo	Wireweed	
Okeechobee gourd	Slash pine	Tiny polygala	
Beautiful pawpaw	Royal palm	Lewton's polygala	
Garrett's mint	Orchid	Key tree-cactus	

EVERGLADES NATIONAL PARK (RIVER OF GRASS)

The largest subtropical wilderness in the United States, Everglades National Park protects an unparalleled landscape filled with curious flora and fauna. At nearly 1.5 million acres in size, the park provides important habitat for numerous rare and endangered species like the manatee, American crocodile, and the elusive Florida panther. These collective environments are the backdrop for the experience. The cast needs their stage and each of these sets rely on its inhabitants and vice versa.

Hardwood Hammock

A hardwood hammock is a dense stand of broad-leaved trees that grow on a natural rise of only a few inches in elevation. Hammocks can be found nestled in most all other Everglades ecosystems. In the deeper sloughs and marshes, the seasonal flow of water helps give these hammocks a distinct aerial teardrop shape.



Pineland

Otherwise known as pine rocklands, these forests often take root in the exposed limestone substrate of south Florida. Though the rugged terrain is canopied almost entirely by slash pine (*Pinus elliotii* var. *densa*), the understory boasts an amazingly diverse assemblage of flora, including numerous endemic species that grow only in the local area.



Mangrove

Mangrove forests are present in the coastal channels and winding rivers around the tip of south Florida. The term "mangrove" does not signify a particular botanical relation, but rather is used to identify several species of salt-tolerant trees that thrive amidst the harsh growing conditions of the coast.



Coastal Lowlands

Located between the tidal mud flats of Florida Bay and dry land, the coastal lowlands are a well-drained region of shrubby, salt-tolerant vegetation. Periodic flooding and the onslaught of heavy winds brought on by tropical storms and hurricanes keeps these areas markedly devoid of mangroves.



Freshwater Marl Prairie

A complex mixture of algae, bacteria, microbes, and detritus that is attached to submerged surfaces, periphyton serves as an important food source for invertebrates, tadpoles, and some fish. Periphyton is conspicuous and is the basis for the marl soils present. The marl allows slow seepage of the water but not rapid drainage. Though the sawgrass is not as tall and the water is not as deep, freshwater marl prairies look a lot like freshwater sloughs.



Freshwater Slough

Dotted with tree-islands, the vast Everglades landscape channels life-giving waters from Lake Okeechobee southward. Everglades National Park contains two distinct sloughs. On the west is the larger Shark River Slough, also known as the "River of Grass." The smaller, narrower Taylor Slough lies to the east of Shark River Slough. Both sloughs discharge into Florida Bay. A series of other sloughs that flow through the Big Cypress Swamp supply freshwater to western Florida Bay and the Ten Thousand Islands. The Shark River Slough found in Shark Valley and the Taylor Slough which flows near Royal Palm.

INVASION OF THE BURMESE PYTHON



Cypress

Where the limestone substrate has given way to circular solution holes, it is common to find a cluster of cypress trees growing in the shape of a dome, with larger trees in the middle and smaller trees all around. Cypress strands occur where the cypress trees grow in an elongate, linear shape, parallel with the flow of water. In areas of less-favorable growing conditions, stunted cypress trees, called dwarf cypress, grow thinly distributed in poor soil on drier land.



Marine & Estuarine

Florida Bay, the largest body of water within Everglades National Park, contains more than 800 square miles (2,072 square kilometers) of marine bottom, much of which is covered by submerged vegetation. Seagrass and algae provide shelter and sustenance to numerous marine organisms, which in turn sustain the food chain that supports all higher vertebrates in the bay.



INFLUENCES

I have included a list of other ideas that allowed me to conceive this mobile application. As the design process unfolded, different elements were considered and other borrowed. I want to make the next gradual step in interactive media and some of these influences were seeds, while other expanded upon.

Nature Documentaries

From the original idea evolving from a viewing of Animal Planet to recreating a digital documentary for the Demo mode, the brilliant nature documentaries from videographers such as National Geographic and PBS heavily influenced the invention for this app. My hope is that when it is being played and another person is viewing it, it appears as though the user is directing the snake in a virtual nature documentary.

Flight Control

I remember the first time I played Flight Control and I immediately became hooked on how modern touchscreens had innovated user interfaces. You literally draw the path for the plane to guide air traffic and it was implemented perfectly. My hope is for this app to be a success, the core gameplay of the snake is as intuitive as maneuvering airplanes in Flight Control.

The Sims

The Sims is a game that has a broad audience and mass appeal due to its open-ended, consequence-related gameplay. In this regard, I want Invasion to follow a similar premise. You are living the simulated life of a snake in a real situation, but the experience has been fine-tuned for optimality from an application standpoint. The continuous cycle of needs that must be satisfied to survive, but not quite as elaborate as in The Sims.

Metal Gear Solid 3: Snake Eater

In Metal Gear Solid 3: Snake Eater, the user portrays a survivalist in the jungle. Stealth and camouflage-based gameplay are encouraged, and this is something I feel is important for "Invasion". The Burmese Python is a silent killer that stalks its prey and strikes violently within an instant. In Metal Gear you are

performing tactical espionage, but this app is about survival of the fittest. Remaining hidden and only reveal your location when necessary is crucial for making it through the swamp alive.

Grand Theft Auto

The Grand Theft Auto series well known for providing open sandbox worlds for the user to explore freely. I intend to create this atmosphere for “Invasion”. There should be a sense of constant exploration and different interactions with the environment and its inhabitants. Much of the A.I. with programmed with consideration for how the real world counterparts would behave. Data about the Everglades with also be assessed for locations of the different terrains and concentration of plants/animals.

The Legend of Zelda: Ocarina of Time

When Nintendo took the Legend of Zelda series to 3D on the Nintendo 64 there introduced a play mechanic I believe may solve my camera problem. The Z-targeting was used for the battle system and I am under the impression that a similar setup would well for “Invasion”. For example when your snake has gotten near a prey of interest it could essentially “lock on” which would allow the user to follow without worrying about camera manipulation. This should also clear up issues with having a good angle when setting up a strike/constriction combo.

Pokémon Snap

Another Nintendo 64 game that I only remember from watching younger friends play, but what influenced me was the concept of a virtual expedition. I think the main theme about this app should resonate with the user more than invasive species or conservation is that nature is real, beautiful and should be experienced. A place like the Everglades may not be for everyone, but I just hope these messages are somewhat conveyed.

TECHNICAL FLOWCHART

Artificial Intelligence

The details of nature have to be considered when programing the artificial intelligence for this app. This area is not going to be able to be fully completed until experts have been consulted with.

User Interface

AVAILABLE TECHNOLOGIES

Unity

ASSET DEPENDENCIES

CREDITS